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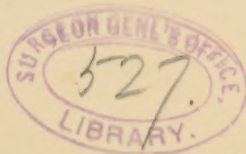
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## **THE TREATMENT OF FRACTURES.**

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WHILE many changes and many advances have been made in modern surgery, it is somewhat surprising, at first glance, to see how little has been the change in that part of it devoted to the treatment of fractures. This surely cannot be because other branches are of more importance, and consequently attract more attention and investigation, for this is almost the only ground on which physicians and surgeons meet on an absolutely neutral plane. The treatment of fractures is of as vital importance to the physician as to the surgeon; indeed, it is, perhaps, most frequent that the physician is called upon in emergencies of this character. Every one who professes to be a doctor, no matter what his specialty, is supposed to be able at least to mend a broken bone. Both the physician and the surgeon have been more frequently called to answer suits for malpractice resulting from the treatment of fractures than from any other cause, and while other operations bring much higher recompense, few are capable of bringing heavier losses. Thus, it would seem that if from no other consideration than a pecuniary one, the correct treatment of fractures



would have become a study second in importance almost to none.

A badly managed case of pneumonia or typhoid may never live to complain, and an unsuccessful case of operation for strangulated hernia or for an inflamed appendix may join the silent throng, and leave behind but few to cavil at the physician's skill; but a badly managed fracture, with its deformity or impaired usefulness of limb, will stalk through the neighborhood and through the streets, threatening its unfortunate author, defaming his character, ridiculing with its mute witness his skill, and detracting by its persistent propinquity from his reputation not only as a bone-setter but as a physician or surgeon. The reason for this lack of progress is because the indications for the treatment of fractures have been so long known, so definitely and positively demonstrated, that little can be added. It is true that more or less varied means have been devised to meet these indications, but they have, after all, differed but little in principle. The mechanical genius and enthusiasm of some have given us many varieties of splints, but they were all practically made to fill the same indications, and succeeded in this aim about as well as those of less imposing curves and more modest pretensions.

The indications for the treatment of fractures are briefly as follows: Reduce the fragments to their proper places; retain them in position; combat inflammation; restore function; relieve pain.

I shall take up the several indications in turn. First, reduce the fragments to their proper place.

At once the question arises, When should this be



done? Is it best to extemporize something at the scene of the accident, or is it best to wait until the patient is at the office, or his home, or in the hospital? Obviously this depends largely upon the nature of the fracture. An uncomplicated fracture of the radius or ulna, or one of the tibia, may often be promptly adjusted and held in place by the most simple of extemporaneous splints, but, generally speaking, it is best to wait till the surroundings are more favorable for efficient work; particularly is this the case in fractures of the femur or of any bones in which the break extends into a joint. There should, however, always be a provisional splint or support applied before the patient is moved. Even without the reduction of the deformity, the support of a straight board, or shingle, or pillow, or layers of pasteboard, or the many other devices that may be at hand, will give immense relief to the sufferer, and perhaps prevent the fragments from perforating the skin, or from lacerating still more the already goaded muscles. It is often surprising to find with what facility and freedom from pain an unadjusted fracture may be handled and the patient moved when supported by the rude contrivance we may find at hand.

Again, the question of time may present itself in another light. Suppose the limb is swollen, its normal outlines lost, and the pain intense. Should an attempt be made to adjust the fragments, or should the limb be left without support of splints, and simply treated with local applications to reduce inflammation, in hopes that when this subsides a better reduction may be accomplished? There can

be little question in many of these cases that the reduction of inflammation becomes the all-important indication, but we must remember that the most important thing in the treatment of acute inflammation is rest ; without it local applications of heat or cold, or arnica, or lead and opium, can but prove unsatisfactory. And how are we to obtain rest ? Surely the simple laying of a limb upon a pillow will not suffice. The slightest move of the patient, the incautious meddling of the attendant, may send the jagged ends of bone into the tortured tissues, and add new fuel to the flames already burning.

I believe that these cases demand splints. I grant that it is often impossible to restore the fragments to their natural position, except under chloroform, and in these cases an anesthetic is nearly always needed, but the limb can be nearly straightened, the muscles can be put in a position favorable to decrease of tension, a crushed joint may be put at rest ; retention-splints can be gently applied, the limb elevated, and then, if you choose, local applications to reduce inflammation may be applied. I say, if you choose, because in my own experience it has been comparatively infrequent that other means than rest and elevation have been demanded.

“The reduction of fragments to their proper places” appears best on paper or in text-books ; what we actually do is to restore as nearly as possible the normal outlines of the parts, and while this result is most frequently obtained, yet the actual restoration of the fragments to their normal relations is, I presume, of rare occurrence, except possibly in transverse fractures.

The general principle underlying the reduction of deformity caused by fracture is that of extension and counter-extension, and I have not infrequently heard both physicians and patients tell how hard a pull it was, or how many it took to get the bone straight, and of the exquisite anguish suffered by the patient while this torture was going on. I must confess I cannot understand why this should be. It would seem that in these cases, in which extreme suffering has made the muscles tensely contracted, it would be far better to give chloroform ; under its soothing influence the muscles relax, and a formidable operation is converted into a simple moulding of parts into their normal relations. I believe that the more general use of chloroform would lead to better results in the treatment of fractures, for under its influence, particularly in fractures involving joints, the exact lesion is more readily made out and more accurately adjusted, and it may be well to draw attention here to the fact that when once properly reduced the tendency to displacement subsequently is but slight.

Aside from the danger attached to all anesthetics there is but one objection to the use of chloroform, and in the hands of the thoughtful or careful physician or surgeon even this does not hold ; this is a tendency to too much manipulation because the patient does not feel it. We must remember that, even though unconscious, every motion of the rough ends of bone may be lacerating nerves, arteries, or muscles, therefore the least possible manipulation under any circumstance is most desirable.

It is upon the second indication for the treatment

of fractures, that of maintaining the fragments in position, that the ingenuity and thought of our profession have been bestowed. For generations books have teemed with the devices of mechanics turned doctors or doctors turned mechanics, and well may we of to-day congratulate ourselves that these formidable creations of the past, however well they may have filled the indications in the hands of their inventors, are no longer considered a necessary part of our armamentarium. If there has been any advance in this part of the treatment of fractures, it has been in the return to a more simple means of maintaining the reduction of the fractures.

The invention of new splints and the naming of them after their ambitious inventors are deservingly falling into desuetude, and a splint made with projections and depressions, curves and angles to fit broken bones deeply seated or surrounded with soft tissues no longer appeals to the judgment of the physician or reaps harvests for the maker. Strips of basswood and "Buck's extension" will suffice, even in the hands of one who is not a mechanic, to treat almost any fracture except those involving joints, and even these when not amenable to treatment in the extended position are best treated by the simplest and least complicated of angular splints.

One cardinal principle must obtain, and that is, having decided the best position for the limb, to use that splint, whether internal or external, anterior or posterior, dorsal, palmar, or lateral, that best holds the fragments in the desired position, and no preconceived notion should make us use a certain form of splint when another will better fulfil the indication.



In regard to fixed dressings, for example those of plaster, I have but a few words to say. Unless the injury to the soft parts is very slight, and unless the parts can be quite accurately coaptated, and unless, further, the case can be under very close observation for the first week or ten days, I am wholly opposed to their use. The danger of gangrene from pressure in an acutely swollen leg, or the displacement of fragments as the swelling subsides, makes their disadvantage very serious, and whatever good results may have been obtained by those who use them, it yet remains to be shown that the non-permanent method is not safer, and its results not so good or better.

Meddlesome interference with fractures is to be deprecated, but still more are we to censure that fear or lack of knowledge that permits the splints as first applied to remain on indefinitely till union is accomplished. I have seen numerous instances in which, rather than disturb a fancied good setting, the limb has swollen about the splint, intense pain has supervened, and yet as long as vitality showed itself in finger-tips or toes the splints remained, till finally, when at last removed, a decubitus had formed extending down to the bone or tendons, or a tendo-synovitis established that has perhaps almost permanently impaired the use of the limb.

A fracture perfectly set shows but little tendency ordinarily to be again displaced, so that with average care the splints can be removed on the first or second day and the adjustment corrected or verified without pain or danger to the patient, and this, I believe, should, with few exceptions, be a routine

practice. It is to be remembered that at about the end of the first week actual repair begins, and we should be certain before this time that the fragments are in the position that we desire them to be when union is completed.

Closely allied to the maintenance of fragments in position is the combating of inflammation. One of the greatest aids to this end is the reduction of the fragments to their place and maintaining them there, thus relieving the soft tissues of a source of constant irritation. Elevation, by bringing into use the force of gravity, and thus assisting in the unloading of over-charged vessels, is of great importance ; general position also adds its share in securing the comfort of the patient.

Of all local applications, heat and cold demand the greatest consideration and confidence. It has, I think, been altogether too common to decry the use of cold in treating inflammation resulting from fractures. The same judgment is here required as to whether cold or heat is best as is required in the consideration of the treatment of any other injury. Some cases, such as those occurring in the aged or in delicate or rheumatic persons, at once suggest to us the impropriety of using cold ; while in the healthy or in the plethoric, particularly if the fracture extends into the joint, ice-cold applications are of the greatest benefit, and their use cannot be too strongly urged. Of course, a time comes when the continued use of either heat or cold is not indicated ; but this is a question whose decision must be made by the attendant, and for which no fixed rules can be laid down.

The majority of topical applications owe their value here, as they do in other inflammations, to the evaporation and consequent cooling of the surface that occur when they are used, and they are therefore to be regarded as entirely secondary in efficiency to the use of cold or heat.

I here mention the relief of pain as one of the indications in the treatment of fractures, because I desire to emphasize the fact that properly adjusted fractures rarely cause much pain, and the administration of an anodyne for this purpose, except possibly during the first day, is not ordinarily necessary. Persistent and excruciating pain is always, in my own practice, an indication for prompt removal of dressings and careful revision of the splints, paddings, and bandages, or the readjustment of the fracture. A very slight change in the dressing will often give instant relief from pain, and if the importance of this fact were more generally appreciated there would be less frequent administrations of anodynes and more careful investigation of the dressings, and consequently more carefully adjusted fragments. Serious pain at the seat of fracture persisting after the second day is almost invariably due to a faulty replacement of fragments, and is in all cases an imperative indication for readjustment of splints or bandages.

The last indication, that of restoration of function, must be kept in view from the very first. Not every fracture will permit of complete restoration of function. Important structures may have been injured or joints entered that may render it obvious from the start that complete restoration can never occur; but we must always strive for the best under existing circumstances. The causes of impairment of function are

various, and among the more obscure ones are to be mentioned injured nerves and compressed and obliterated vessels. The most common cause in uncomplicated cases, however, seems to be long-continued fixation of the neighboring joints, rendering them stiff and painful when the time comes for using them. Fortunately, as this is the most common cause, so it is the one most easily counteracted, and that by the use of frequent massage and early passive motion of the joints. I grant that this consumes more time than we often feel inclined to bestow, but the benefit to be derived is none the less positive. In connection with this I wish to urge the early abandonment of splints. Certain complications, such as non-union or fibrous union, may interfere with all rules; but, as a general statement, from two to three weeks for children, and from three to four weeks for adults, is a sufficient length of time for a splint to remain on. This would hardly apply, however, to fractures of the femur, in which it is not infrequently necessary to maintain the splints for six or eight weeks, or even longer, though here too the general law holds that dressings should be removed at the earliest possible moment and massage and passive motion instituted. While early passive motion in cases of fractures extending into the joint is opposed by some, and while there undoubtedly exist some theoretic objections to it, yet as the outcome of practical experience I can most heartily recommend it, and constantly make use of it in my own practice.

The discussion of the treatment of compound or other than simple fractures, or of the many complications that may occur at the time of the injury or subsequently, is not attempted in this paper. I have



endeavored to confine myself solely to the general indications for the treatment of simple fractures, and as a summary, desire to call attention to the following propositions :

1. The indications for the treatment of fractures are positive and fixed.

2. All fractures should be adjusted at the earliest possible moment consistent with the obtaining of proper appliances or assistance.

3. We should not wait for inflammation to subside before placing the fracture in some kind of a retention-apparatus or splint.

4. Chloroform should be administered more frequently to facilitate diagnosis and adjustment.

5. When properly reduced there is comparatively slight tendency to redisplacement.

6. Simple splints are to be preferred to moulded ones.

7. Use that splint that best fulfils the indication, regardless of preconceived ideas.

8. Non-permanent are ordinarily to be preferred to permanent dressings.

9. Dressings should be opened up and fractures examined not later than the second day.

10. Rest and elevation are the best means of combating inflammation.

11. Cold is not contra-indicated in robust patients, particularly if the fracture extends into a joint.

12. Pain is best relieved by revision of the dressings.

13. Early passive motion and frequent massage are the best means of restoring function.





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